

Storm Drainage Standards and Guidelines



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Chelan County

Storm Drainage Standards and Guidelines

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Section 1: Introduction

Storm Drainage Standards and Guidelines are set forth to protect life and property from loss and damage by flooding, to protect streams, creeks, and lakes from pollution and excessive flows.

Section 2: Purpose:

The following storm drainage standards and guidelines are intended to reduce and prevent adverse storm drainage impacts. They represent the minimum design standards for the construction of storm drainage facilities and stream channel improvements within Chelan County. Compliance with these standards does not relieve the designer, owner or developer of the responsibility to apply conservative and sound professional judgment to protect the health, safety and welfare of the general public. Special site conditions and environmental constraints and considerations may require a greater level of protection than would normally be required under these standards.

Section 3: When a Drainage Plan or Drainage Review is Required:

- A. Permanent drainage facilities shall be provided on property improvements within Chelan County in accordance with the Standards for the following types of improvements, unless exempted under Section 4 or approved for modification under Section 13 of these guidelines:
 - i. All plats and short plats creating new building lots of 0.75 acres or less in individual lot size.
 - ii. All developments, including remodeling, reconstruction, and new construction adding five (5000) thousand square feet or more of new impervious surfaces, including gravel parking areas.
 - iii. Developments entailing construction which would change the point of discharge of surface waters, discharge surface waters at a higher velocity and/or quantity than that of the pre-development discharge rate, or, tend to add to pollution of surface waters.
 - iv. Any proposed development adjacent to the 100 year flood plain of any stream or lake.

Section 4: When Plans Are Not Required:

The drainage plan requirement under Section 3 may be waived if the applicant can demonstrate that the proposal meets the following conditions A, B, and C, or meets condition D.

- A. Will not adversely impact the water quality conditions of any affected receiving bodies of water.
- B. Will not alter the drainage pattern or increase the peak discharge.
- C. Will not cause runoff exceeding the available capacity of the existing drainage system where such system was designed to serve the proposed development area.
- D. Is part of an agricultural drain system and the drainage consists of excess irrigation waters not subject to agricultural chemical contaminants.

Any variance to the applicability of drainage plan requirements shall be applied for as provided in Section 13.

Section 5: General Standards and Guidelines:

All persons proposing land development and/or approvals as outlined in Section 3 shall provide a drainage plan for surface water flows entering, flowing within and leaving the subject property. The plan is to conform to the following standards and requirements:

- A. The Chelan County Director of Public Works may require plans for storm drainage and detention facilities to bear the stamp and seal of a registered Civil Engineer currently licensed by the State of Washington and qualified by experience and education in the field of hydraulics, hydrology, or a closely related field. Storm drainage plans or revisions to any approved plan shall be reviewed and approved by the Public Works Department prior to any construction.
- B. Storm drainage must be sufficient to mitigate flooding, erosion, sedimentation or pollution resulting from the development proposal.
- C. All drainage system elements must provide for adequate maintenance and accessibility. Storm drainage facilities shall be designed to eliminate interference from underground utilities and from conditions which exceed design loads for any pipe or other structural element.
- D. The designer of any storm drainage system element shall consider system reliability in terms of layout, specifications of materials and methods of installation.
- E. The impact of a system failure should be analyzed both in terms of on-site and off-site effects. The impacts may be to adjacent or downstream properties or to elements of the public drainage system or other private systems.
- F. No drainage originating inside of a building or structure shall be connected to the storm drainage or surface water systems.

- G. Drainage systems shall be designed to meet applicable State and Federal requirements for water quality prior to discharge to any wetland, stream, or lake. The developer shall be responsible for obtaining any Local, State, or Federal construction or discharge approvals or permits.

Section 6: Basic Standards

- A. Discharge at Natural Location: Surface and storm water runoff from a proposed development that would construct new or modify existing drainage facilities should be discharged at the natural drainage location. Diversion may be allowed if it can be demonstrated that it corrects an existing problem without creating a new problem.
- B. Tributary Area Analysis: Proposed developments should identify the upstream tributary drainage area and provide an analysis of the pre-existing drainage volume and quality and an analysis of the impact of the proposal on the drainage system.
- C. Proposed projects must control the peak rate runoff to not exceed the pre-development peak rates for the site, unless it can be demonstrated that exceeding the pre-development rate can be accomplished without deleterious impact to the natural or man-made environment. The methods of peak rate runoff control may include detention, retention and/or infiltration. Where soil conditions allow, infiltration of runoff is preferred.
- D. For all proposed development requiring a drainage conveyance systems, the conveyance system must be analyzed, designed and constructed to handle existing off-site tributary flows and on-site storm drainage flows caused by development of the project.
- E. Development projects requiring clearing and grading for roadway or drainage facility construction shall include an erosion/sedimentation control plan providing suitable measures to prevent sediment laden runoff from leaving the site or impacting roadway or drainage systems. It shall be the responsibility of the owner/developer to implement and maintain suitable and effective erosion/sedimentation control systems. A preconstruction meeting between the Engineer, Owner/Developer, and Contractor to review project erosion control requirements is encouraged and recommended.
- F. Maintenance and operation of all private drainage facilities is the responsibility of the property owner or a properly formed homeowners association. A private drainage facility is defined as a system to convey or treat drainage and detain excess storm drainage generated from developed land, improvements, and new roads constructed as part of a private development.
- G. Adequate easements shall be provided for operation and maintenance of all drainage facilities located on private property.
- H. For the construction or modification of any drainage facility other than roadside ditches, the applicant shall be required to have a construction bond. The construction bond shall be posted prior to beginning construction. The bond shall be in an amount sufficient to cover the cost of work on or off the site as provided in Section 10: Bonds and Liability Insurance.

Section 7: Design Criteria

I. Runoff Control

- A. Developments shall be designed and constructed to provide control of the quality and quantity of stormwater runoff both during and after construction. Erosion and sedimentation control plans shall be submitted and approved by the Public Works Department prior to the beginning of any construction. Peak discharge control and detention facilities shall be provided in accordance with the Development Standards. Biofiltration, oil/grease separation devices or other pollution control mechanisms are to be installed prior to occupancy and release of any performance securities held by the County.
- B. Maximum allowable release rates from stormwater detention systems shall be based upon the pre-development runoff from the development site as described in Section 7.I.D. The allowable release rate shall be determined as specified in these Development Standards and may be modified on a case-by-case basis due to constraints in the drainage system downstream of the point of connection. Storm precipitation distribution and runoff modeling will conform to the Soil Conservation Service Technical Report 55 or other acceptable method.
- C. The on-site drainage system including conveyance, flow restriction, detention, pollution control, and emergency overflow elements must be properly designed and sized to handle runoff from the site and conveyance through the site. The design should be carefully analyzed for potential problems, flow impediments, construction or maintenance difficulties, and potential erosion or other property damage.
- D. The peak discharge rate from the site shall be limited to the pre-development peak rate runoff for the 2-year, 10-year, and 25-year twenty-four hour design storm events. Peak runoff rate shall be computed using the Soil Conservation Service TR-55 Method, modified Santa Barbara Urban Hydrograph Method, or other appropriate models. Stormwater detention facilities shall be provided to store all surface water runoff in excess of the allowable peak discharge in accord with the provisions of these standards, up to the required design storm event. Variances to the required release rate will be considered on a case by case basis.

E. Oil Separation Devices:

Whenever paved parking is provided for more than 20 vehicles, or for any paved parking or access roadway draining to an open waterway or stream, an oil/grease separation device shall be installed. It shall be located at a point where it can be easily maintained and where it will intercept contaminants flowing off road rights of way, parking lots, and other sources of pollutants. Selection and sizing of oil separation device type shall be subject to approval of the Director of Public Works or designee. The applicant should consider the use of vegetative or other natural filtration means as an alternative.

- i. The property owner assumes full responsibility and liability for proper maintenance and operation of the oil separator, unless the separator is a part of a publicly operated drainage system. This statement must appear on the recorded drawings for the development.
- ii. Access to the separator shall be maintained.

F. Erosion and Siltation Control:

In addition to catch basins, measures such as suggested in Section 6-E of these standards should be provided as necessary during and after construction to prevent erosion and to prevent silt from being carried off-site and/or into receiving bodies of water.

II. Detention Facilities

- A. All storm water runoff originating from and/or draining from any proposed development shall be controlled and/or conveyed in accordance with all County standards and policies and as described in these Standards. When existing conditions make storm water detention impossible for a portion of a site, in lieu of providing detention for such an area, at the discretion of the Director of Public Works, compensatory storage volume and reduction of allowable release rates may be provided on another portion of the site. In no case shall the runoff from the total site exceed the allowable release rate.
- B. The stormwater detention requirement may be waived at the discretion of the Director of Public Works when a direct discharge of “100 year” or greater capacity in conjunction with pollution control to a major receiving body (Lake Chelan, Lake Wenatchee, Columbia River, Wenatchee River) is provided. Said control or conveyance of storm water runoffs shall be shown on a drainage plan which shall be prepared by the developer’s licensed engineer and shall be submitted for review and approval by the Public Works Department.
- C. The stormwater detention requirement may be waived at the discretion of the Public Works Director if the volume of storage calculated for that development is less than 250 cubic-feet and if the site or downstream system has no environmental, hydraulic, or hydrologic constraints which must be mitigated by providing storage.
- D. Prior to occupancy of any single phase of a phased development, functional storm drainage facilities must be completed and operational to provide runoff control, detention, and water quality treatment for the phase for which occupancy is requested.

- E. Storm water detention systems should be designed to maximize reliability, ease of maintenance, and water quality of runoff and should minimize hazards to persons or property (both on-site and off-site), nuisance values, and risk of failure.
- F. Sufficient detention storage capacity shall be provided to store the excess runoff from the developed site during a storm event having a probability of occurrence commonly known as the “25-year storm”. A non-erosive overflow path should be provided from each detention facility to protect adjacent property from damage.
- G. Sizing: In calculating the storage volume provided, “dead storage” in wet ponds shall be excluded, i.e. that volume of water which must be assumed to be present in the detention system at the commencement of the design storm. Any volume at a level below that of the outfall invert must be presumed to be dead storage, e.g. catchments.
- H. Controlled Overflow Requirements: All detention storage facilities should include a provision for control of overflows, and suitable data shall be provided to support the design. Under no circumstances should the overflow be overland over private property not included as part of the development without written permission.
- I. Site, Soil and Infiltration Data Requirements for Calculating Effective Infiltration Rates to Reduce Storage Requirements.
 - i. General Data Requirements:
 - a. The proposed site should have favorable topography to preclude high runoff rates. Engineering calculations shall be included with any submittal to show that there will be no adverse impacts due to the reduced storage. Such adverse impacts may include but not be limited to, increased frequency of overflows.
 - b. A log of the soils and infiltration test data should be submitted to reveal site soil conditions and infiltration rates.
 - c. An adequate number of test holes should be located over the proposed site to substantiate representative conditions for the final layout of the development, and as a minimum condition, test holes shall be located in each area and at the elevation proposed for infiltration.
 - d. Groundwater depth, location, flow and general characteristics shall be considered.
 - e. The designer shall demonstrate the adequacy of the depth to the impervious layer below the bottom of the proposed infiltration trench or basin.

- ii. **Soil Data Requirement:** A soil log may be required to describe soil type and depth along with a site map showing the location of each test hole. Classification may be in general terms such as loose sand, sandy silt, clay hardpan, rock, etc. or classification may be in specific terms as described by the U.S. Department of Agriculture (Soil Conservation Service). The soil log should include the depth to ground water table, if less than twelve (12) feet in depth. A falling head permeability test or similar method must be used to demonstrate the infiltration capacity of the least pervious soil layer.

Section 8: Review and Approval of the Plan

The drainage plan and supporting calculations will be reviewed by the Public Works Department using the Department's construction plan review procedures in coordination with all other County land development and/or permit review procedures. The County's review and approval of storm drainage control plan shall not relieve the applicant, owner and/or designer of liability for errors or omissions in the design of storm drainage facilities.

All storm drainage plans prepared in connection with any of the permits and/or approvals listed in Section 3 shall be submitted for review and approval to the Public Works Department.

Any applicant or property owner proposing an action that may require a storm drainage plan may request a preliminary review of the proposal by the Director and a determination of the need for a drainage plan pursuant to Sections 3 and 4.

Until a financial plan is in effect to fund dedicated staff time, review of drainage plans by Chelan County Public Works will be subject to staff workload and availability. In order to facilitate timely review, applicants are encouraged to submit complete drainage plans meeting all applicable requirements of these guidelines. Incomplete or inaccurate plans will be returned to the applicant for correction and resubmittal. Winter weather conditions or accumulated snowfall may result in delays to plan field reviews and final approval dates. Public Works will endeavor to provide the applicant a response regarding plan approval status no later than 30 days after submittal of the plans.

Section 9: Fees:

No fees are assessed at this time.

Section 10: Bonds and Liability Insurance

The Public Works Department may require persons constructing storm drainage facilities to post with the County surety and cash bonds or certified check in the amount of one hundred twenty five percent (125%) of the estimated construction cost. Whenever the property owner is required to post other bonds on the project or on construction related to the facility, the bonds may, with the permission of the Director, be combined into a single bond to the extent allowed by law; provided, that the amount thus bonded shall not at any time be less than the amount that would be required under separate bonds. The single bond shall clearly specify on its face those separate bonds which it is intended to replace.

- A. **Construction Bond:** Prior to commencing construction the owner or person constructing the facility shall post a construction bond, or, in lieu of a bond the applicant may establish a cash escrow account with his/her bank or with the County Treasurer in the amount specified above. The amount of the bond or cash account shall be sufficient to reimburse the County if it should become necessary for the County to enter the property for the purpose of correcting and/or eliminating hazardous conditions relating to soil stability, erosion and/or drainage control. The instructions to the escrow agent shall specifically provide that after prior written notice unto the owner and the owners failure to correct and/or eliminate existing or potential hazardous conditions in a timely manner, the escrow agent shall be authorized without any further notice to the owner or his consent to disburse the necessary funds to the County for the purpose of correcting and/or eliminating such conditions as specified in the County complaint. After determination by the Department that all facilities are constructed in compliance with the approved plans the construction bond shall be released.
- B. **Liability Policy:** The owner or person constructing the storm drainage facility shall maintain a liability policy during the construction period with policy limits of not less than one hundred thousand dollars (\$100,000.) per individual, three hundred thousand dollars (\$300,000.) per occurrence and fifty thousand dollars (\$50,000.) property damage, which shall name Chelan County as an additional insured without cost to the County.

Section 11: Standard Drainage System Maintenance

Maintenance of storm drainage facilities on private property shall be the responsibility of the owner(s). This responsibility and the provision for maintenance shall be clearly stated on subdivision and short plat plans, property conveyance documents, and/or drainage improvement plans.

Where drainage system maintenance responsibility is to be shared by more than one property owner, appropriate drainage system maintenance and upgrading agreements shall be prepared and recorded prior to final plat approval by Chelan County Public Works.

Section 12: Appeal Procedure

In the event of a determination by the Director that drainage plans are required, the applicant shall have the right to have the determination reviewed by the Chelan County Board of Commissioners, or the owner may make corrective provisions to the project as necessary.

Section 13: Variances

The applicant may request variances from these Storm Drainage Standards and Guidelines. The variance application shall be addressed to the Director.

Applications Required: Applications for any variance shall be submitted in writing. The application shall state fully all substantiating facts and evidence pertinent to the request.

Variance Requirements: The Director may grant a variance from the requirements of these standards and regulations when, in his opinion, undue hardship may be created as a result of strict compliance with the provisions of these standards and requirements. The Director may recommend conditions that he deems necessary to be desirable for the public interest. No variance shall be granted unless it can be shown that:

- A. There are special physical circumstances or conditions affecting said property such that the strict application of the provisions of these standards and requirements would deprive the applicant of the reasonable use or development of his land; and
- B. The variance is necessary to insure such property the rights and privileges enjoyed by other properties in the vicinity and under similar circumstances; and
- C. The granting of the variance will not be detrimental to the public welfare or injurious to other property in the vicinity.

Criteria: Before a variance is granted a determination shall be made that shall include, but not be limited to, the following criteria:

- A. Adequate capacity of downstream facilities;
- B. Acceptability of receiving bodies of water;
- C. Possibility of adverse effects of retention; and
- D. Adequate maintenance capability.

Section 14: Construction Certification

Upon completion of construction of any storm drainage facilities required under these guidelines, a letter of certification shall be submitted to Chelan County Public Works stating that the constructed drainage facilities substantially conform to the approved plans and specifications. The letter of certification shall bear the seal and signature of a licensed Civil Engineer, or the signature of the owner where an engineered design was not required. This letter of certification shall be submitted prior to final plat approval or release of financial guarantees in the case where drainage improvement construction was bonded.